

## WHAT IS CLAIMED IS:

1        1. A method of time scale modification of a digital  
 2 audio signal comprising the steps of:  
 3        analyzing an input signal in a set of first equally  
 4 spaced, overlapping time windows having a first overlap amount  
 5  $S_a$ ;  
 6        selecting a base overlap  $S_s$  for output synthesis  
 7 corresponding to a desired time scale modification;  
 8        calculating a cross-correlation  $R[k]$  for index value  $k$   
 9 between overlapping frames for a range of overlaps between  
 10  $S_s + k_{\min}$  to  $S_s + k_{\max}$  for a fixed length overlap region;  
 11        selecting a value  $K$  yielding the greatest cross-  
 12 correlation value  $R[k]$ ;  
 13        synthesizing an output signal in a set of second equally  
 14 spaced, overlapping time windows having a second overlap  
 15 amount equal to  $S_s + K$ .

1        2. The method of claim 1, wherein:  
 2        said step of calculating the cross-correlation  $R[k]$   
 3 employs the equation

$$5 \quad R[k] = \sum_{i=\text{initial}_x}^{\text{final}_x} \text{sign}\{y[mS_s + i + k]\} \cdot \text{sign}\{x[mS_a + i]\}.$$

1        3. The method of claim 1, wherein:  
 2        said step of calculating the cross-correlation  $R[k]$   
 3 employs only a center half of the overlap region for  $k = 0$ .

1        4. A digital audio apparatus comprising:  
 2        a source of a digital audio signal;  
 3        a digital signal processor connected to said source of a  
 4        digital audio signal programmed to perform time scale  
 5        modification on the digital audio signal by  
 6                analyzing an input signal in a set of first equally  
 7                spaced, overlapping time windows having a first overlap  
 8                amount,  
 9                selecting a base overlap  $S_s$  for output synthesis  
 10                corresponding to a desired time scale modification,  
 11                calculating a cross-correlation  $R[k]$  for index value  
 12                 $k$  between overlapping frames for a range of overlaps  
 13                between  $S_s + k_{\min}$  to  $S_s + k_{\max}$  for a fixed length overlap  
 14                region;  
 15                selecting a value  $K$  yielding the greatest cross-  
 16                correlation value  $R[k]$ ,  
 17                synthesizing an output signal in a set of second  
 18                equally spaced, overlapping time windows having a second  
 19                overlap amount equal to  $S_s + K$ ; and  
 20        an output device connected to the digital signal  
 21        processor for outputting the time scale modified digital audio  
 22        signal.

1        5. The digital audio apparatus of claim 4, wherein:  
 2        said digital signal processor is programmed to calculate  
 3        the cross-correlation  $R[k]$  employs the equation  
 4

$$5 \quad R[k] = \sum_{i=\text{initial}_x}^{\text{final}_x} \text{sign}\{y[mS_s + i + k]\} \cdot \text{sign}\{x[mS_s + i]\}.$$

1        6. The digital audio apparatus of claim 4, wherein:  
2        said digital signal processor is programmed to calculate  
3        the cross-correlation  $R[k]$  employing only a center half of the  
4        overlap region for  $k = 0$ .